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ENTOMOLOGICAL NEWS

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The Taxonomic Value of Male Genitalia in the Ithomiidae (Lepidoptera)

By RICHARD M. FOX, Colorado College, Colorado Springs, Colo.

During the past sixteen years I have studied more than 20,000 Ithomines and have been able to account for nearly all the names published to date for subspecies and species. Hundreds of dissections of male genitalia have been made, with most of the names represented. In view of this rather comprehensive survey of the family, it may be of interest to summarize the worth of the male genitalia as taxonomic criteria in the Ithomiidae. It is understood, of course, that sound taxonomy can be based under no circumstances only on a single criterion. Nor is it thought that the findings presented here will appear new or startling to the experienced systemist; this study has the merit only of being based on comprehensive data within one major taxonomic category.

J. Kremky was the first to use male genitalia for systematizing the Ithomines (1925). This pioneer work suffered from being based on a small collection rather than on fully representative material. In recent years, R. F. d'Almeida has made several attempts (1939–45) to utilize male genitalia as a basis for the classification within this family.

I find that the family Ithomiidae includes some 349 species, many of them strongly polytypic, grouped into 45 genera and into two subfamilies of unequal size. (By way of contrast, Bryk's catalogue (1937) listed 518 species in 38 genera.) The smaller subfamily contains only the genus *Tellervo*, which in turn com-

prises a single, strongly polytypic species found in the Australian tropics. The other subfamily, the Ithomiinae, is found in the American tropics and is divided into eight tribes.

At the family level, male genitalic structures are in this case not specific. There is no characteristic feature common to all the Ithomiidae but unlike the genitalia of any other family. However, these structures indicate interfamilial relationships, although nothing not also indicated by other structures such as the fore legs, the antennae, the palpi, the wing venation or the pattern anatomy.

Four of the eight tribes in the Ithomiinae have characteristic male genitalia enabling immediate tribal identification from these structures alone. The other four tribes cannot be diagnosed surely by the male genitalia, so that their separation depends on the analysis of other structures.

For identifying the 45 genera in the family, there are 44 recognizable and definable kinds of male genitalia. Here these structures are clearly of great value. However, two of the primitive genera, *Tithorea* (containing two species) and *Elzunia* (containing seven species), are identical in the male genitalia, although nearly every other structure separates the two genera and the included species.

Fifteen of the 45 genera are monotypic; thus 334 of the species belong in 30 genera. In 23 of these polytypic genera, all included species can be distinguished by the male genitalia. In one genus (*Scada*) slight but constant differences enable the recognition of the subspecies. Thus in seven polytypic genera, male genitalia will not differentiate species. Two of these are *Tithorea* and *Elzunia*. In the remaining five polytypic genera, male genitalia neatly diagnose species groups, but do not differentiate the species within the groups.

The traditional way to identify a butterfly is by means of its color and pattern. It is more than a little dangerous to rely on color and pattern to sort the Ithomines into species, however, and this is caused by three curious phenomena: There are a number of cases of remarkable parallel evolution of pattern and color by which "sibling" species occur; there is quite extensive mimicry

within the family; the subspecies of a polytypic species frequently show striking divergence in coloring and in development of the pattern. As a consequence, one must examine very carefully two Ithomines that look alike, for they may be different species; and conversely, when one has an aggregation of different-looking members of a genus, they can easily belong to a single species. Not colors and spots, but structures must be studied. Thus the male genitalia frequently are of the utmost value for untangling the taxonomic snarl.

In the following table, the number of species in each tribe is listed to show how many can be identified with male genitalia to species, how many to species group only, and how many do not separate by male genitalia.

Tribe	*to species*	*to species group*	*no separation*
Tellervo (genus)	1		
Tithoreini	10		9
Melinaeini		13	
Mechanitini	14	10	
Napeogenini	3	72	
Ithomiini	25		
Olereini	68		
Dircennini	71		
Godyrini	53		
Total species	245	95	9
% of species	70.2	27.2	2.5

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New Species of Acmaeodera from California (Coleoptera: Buprestidae)

By Josef N. Knull, Department of Zoology and Entomology, The Ohio State University, Columbus, Ohio

Acmaeodera fattigi n. sp.

♀. Rather robust, elongate, cuneate at apex; ground color shining black; each elytron with yellow spots as follows: one in middle at base, two back of base, two at middle, two back of middle and one near apex, an elongate red spot at apex, elytra and sides of pronotum clothed with appressed plumose white scales; head and rest of pronotum densely clothed with white pubescence; ventral surface densely clothed with appressed plumose scales.

Head convex, covered with large shallow punctures; antennae serrate from fifth segment.

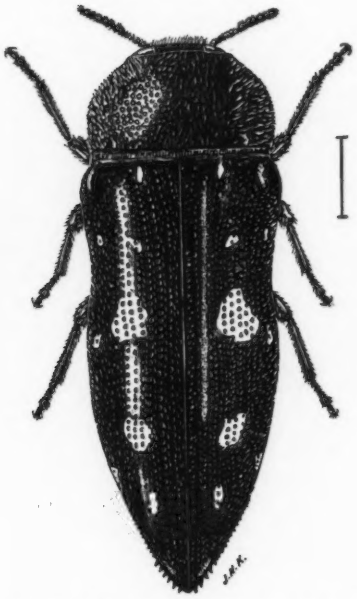
Pronotum convex, much wider than long, widest in middle, wider at base than apex; sides broadly rounded, constricted at base and apex; disk with slight median depression at base and one each side; surface densely coarsely punctate, punctures larger and closer on sides, base transversely corrugated.

Elytra at base as wide as base of pronotum; sides expanded back of base, then constricted and again expanded at middle, converging to rounded coarsely serrate apices; disk convex, umbone prominent; surface with closely placed large punctures forming striae, interspaces finely punctate, outer interspaces near apex serrulate.

Anterior margin of prosterum with wide emarginate truncation, margin not reaching lateral prolonged front angles. Abdomen beneath densely, finely punctate, punctures concealed by vestiture; last visible segment not modified.

Length 7.1 mm.; width 2.5 mm.

Holotype ♀ collected at Jacumba, San Diego Co., California, July 6, 1952. Two *paratypes* collected at Mountain Springs, same county, June 28 and July 6, 1952. All specimens collected by D. J. and J. N. Knull and in collection of author.



Acmaeodera fattigi n. sp. (Line equals 1 mm.)

This species should stand next to *A. mimicata* Knull (1938) from which it can be separated by the cuneate elytral apices, yellow mark at base of each elytron and elongate red mark at apex.

The prosternal margin is similar to that of *A. pinalorum* Knull (1950); however the long pubescence on elytra will separate *A. pinalorum* from *fattigi*.

I take pleasure in naming this species for P. W. Fattig, who has added much to our knowledge of Georgia insects.

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A Taxonomic Note on the Larvae of Aedes Schizopinax Dyar

By WILLIAM D. SUDIA, Communicable Disease Center, Public Health Service Federal Security Agency, Atlanta, Georgia

Aedes schizopinax Dyar is considered by most mosquito authorities to be quite rare. Dyar described the species in 1929, and it has apparently only been recorded since then by G. Allen Mail from Gallatin and Jefferson Counties, Montana, and Mammoth Hot Springs, Wyoming. Matheson (1944) includes *schizopinax* in his key to *Aedes* larvae where he mentions as the chief character the following: "Scale of comb thornlike, the long apical spine without lateral spinules." Dyar (1929) in his original description states, "Lateral comb of the eighth segment of about 50 scales, each with long thorn-shaped central point and only traces of lateral spinules."

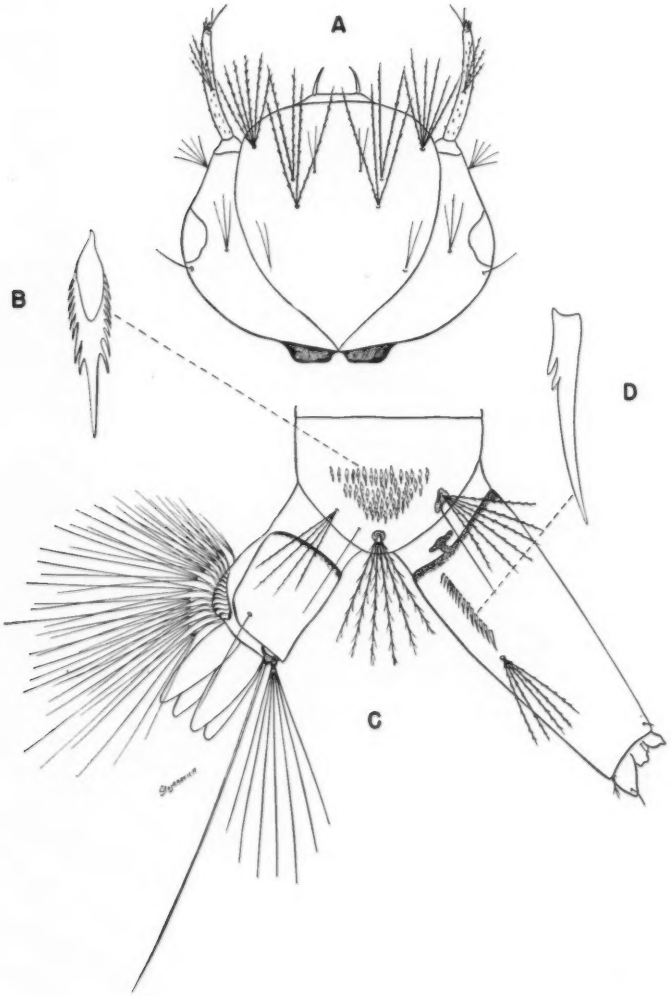
The author has examined the comb scales of 6 of the 13 paratype larval skins from the U. S. National Museum and noted that under the magnification of a dissecting microscope (54x), no lateral spinules could be seen. However, upon closer examination using a compound microscope (430x), lateral spinules could be seen. Dr. Alan Stone of the National Museum kindly examined the larval skin of the holotype and others of the type series. He confirmed the presence of lateral spinules when observed under high magnification, and stated that they were less readily seen under lower magnifications.

The present trend in identification procedures is to confirm such characters as the shape of comb scales under the highest magnification available. If a taxonomist observed lateral spinules on the comb scales, he would be unable to run specimens of *schizopinax* to this species in Matheson's larval key. This situation may possibly explain the rarity of this species.

EXPLANATION OF FIGURES

Details of the larva of *Aedes schizopinax* Dyar. (Drawing based on specimens collected at Sedan, Montana).

A. Dorsal view of head. B. Comb scale of eighth segment. C. Posterior portion of abdomen. D. Pecten tooth.


A
B
D
C

In an attempt to clarify this problem, a detailed drawing of the larva is presented as well as the following key which involves those species included in couplets 45 and 46 on page 135 of Matheson's "Handbook of the Mosquitoes of North America."

1. Upper head hairs with five or more branches.....2
   Upper head hairs usually single to four-branched.....3
2. Mesothoracic hair No. 1 very long and stout; all hairs in anterior submedian prothoracic group of about the same length and thickness (Western).....*pullatus* Coquillett
   Mesothoracic hair No. 1 short and delicate; one hair in anterior submedian prothoracic group single and much longer than the other two hairs (Eastern)...*canadensis* Theobald
3. Individual comb scale rounded at apex, more or less evenly fringed with sub-equal spinules; prothoracic hairs 1–3 single.....*pionips* Dyar
   Individual comb scale pointed at apex, with a large apical thorn and fringed with extremely fine spinules; prothoracic hairs 1–3 not all single.....*schizopinax* Dyar

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The author wishes to thank Chester J. Stojanovich, Communicable Disease Center, Atlanta, Ga., for drawing the illustration accompanying this article. Grateful acknowledgments are also presented to Dr. Alan Stone, U. S. National Museum, and to Dr. H. D. Pratt, Communicable Disease Center for assistance rendered.

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Data on Chlorobenzene Compounds

The SOLVAY PROCESS DIVISION, Allied Chemical and Dye Corporation, has prepared a special bibliography and summaries of tests on the biological activity of various chlorinated benzene compounds, as taken from National Research Council publications. The compilation is for free distribution and as an aid to research workers in organic chemicals. Address: 61 Broadway, New York 6, N. Y.

Current Entomological Literature

Compiled by VENIA T. PHILLIPS, Librarian

Academy of Natural Sciences of Philadelphia

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania pertaining to entomology, including all arthropods except Crustacea. Coverage will be world-wide as regards major contributions to systematics as well as for all papers on morphology, physiology, embryology, etc. In addition, for species from the Americas and the Pacific (Nearctic, Neotropical and Polynesian regions) all minor contributions to taxonomy, distribution, etc., will also be recorded.

This list gives references of the year 1953 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature, see the Bibliography of Agriculture, Washington, and the Review of Applied Entomology, Series A, London. For records of papers on medical entomology see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

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Reviews

A Textbook of Arthropod Anatomy, by R. E. Snodgrass. Ithaca, N. Y., Cornell University Press, Dec. 15, 1952. x + 363 pp. 88 figs. $6.00.

With the remark "arthropods are a group of related invertebrates, arthropodists, for the most part, are a group of unrelated vertebrates," R. E. Snodgrass introduces this text, the latest in his long series of able contributions to our knowledge of the

structure of insects and their relatives. This clearly and interestingly written volume is a descriptive account of mainly the external anatomy of eleven major groups of arthropods. A chapter each is devoted to a discussion of the trilobites; Limulus, the king crabs; the fossil Eurypterids; the peculiar marine Pycnogonids; a scorpion, a tick, and spiders as representatives of the Arachnida; the primitive Tasmanian *Anaspides,* a crayfish, and the isopod *Ligyda* in the Crustacea; a member each of the four major groups of the centipedes or Chilopoda; examples of the two main divisions of the millipedes or Diplopoda; the Pauropoda; the Symphyla or garden centipedes; and in the insects, various species of Diplura and Thysanura and one pterygote, *Periplaneta.* Prefacing each chapter is a discussion of the general characteristics, biology, distribution, and probably relationship of the groups treated. Scattered throughout the text are approximately 650 illustrations distributed among 88 "figures" or plates, all executed in the author's well-known and inimitable clear style. The cockroach hind wing, Fig. 84 A, p. 319, is rather schematic and has evidently been drawn from an aberrant specimen, for it is incorrect in several details. No illustration of the fore wing or tegmen is given. However, the excellent figures and photomicrographs in Smart's recent paper (1951, Proc. Zool. Soc. London, vol. 121, pp. 501–509) will remedy this lack. Explanation of the lettering on the text-figures are, for the most part, given at the end of each chapter rather than under each collection of figures. This involves much turning and searching of pages and, when textual matter and figures are widely separated, sometimes by ten or twenty pages, may prove very exasperating to readers.

The author states he has attempted to evaluate the various theories relating to the ancestry of insects and the evolution of the arthropods and has come to the disconcerting conclusion that "the facts of arthropod structure are not consistent with any proposed theory of arthropod relationships." Many of the theories are succinctly demolished and dismissed and, although no substitute is actually proposed, nevertheless it is evident from comments scattered throughout the text that Snodgrass has probably formulated some definite ideas on the proper grouping of arthropods. The Xiphosurida and the fossil Eurypterida, for example, are completely dissociated from the Arachnida as well as from one another; and the centipedes are clearly separated as a class from the millipedes. Of particular interest to entomologists is the author's complete rejection of the conventional division of insects into the two customary groups: Apterygota and Ptery-

gota. Instead, as others have pointed out in recent years, he shows that the endognath Collembola, Protura, and Diplura form one loose association and that the ectognath Thysanura (s. s.) and pterygotes another very compact and closely related group.

This attractively printed and well-bound text will be invaluable to both students and teachers of zoology and entomology. —V. S. L. PATE.

THE ANTS OF CALIFORNIA, by Thomas W. Cook. (Pacific Books, Palo Alto, California.) xiv + 462 pp., 92 figs. 1953. Price, $10.

The appearance of this book has been awaited by American ant specialists with interest, not to say anxiety, for several years. About the best one can say for it is that it introduces very few new names into the literature. Four new species are described and figured: *Proc[e]ratium californicum, Pogonomyrmex nitratus* (also referred to as *P. californicus nitratus*), *Pogonomyrmex spadix* (also referred to as *P. barbatus spadix* and *P. barbatus spadex*), and *Lasius helvus* (also referred to as *L. helveolus*). The last three of these appear to be safely considered as synonyms of familiar species long known from California, and the *Proceratium,* described from a single male, is enigmatic in more ways than one.

The descriptive material in the book is almost entirely composed of direct copies from the original or subsequent descriptions by other authors, and is largely obsolete for modern purposes. In the preface the author mentions W. S. Creighton's important revision, *The Ants of North America,* and lauds the advances made in the elimination of numerous synonyms and in other simplifications of the taxonomy of our ants, yet Mr. Cook's text reveals scarcely any sign that he has incorporated these advances in his thinking. Most of the old synonyms are without justification disinterred and faithfully listed. The book is profusely and often irrelevantly illustrated, a large part of the drawings being very closely approximate line-for-line copies of figures which first appeared in various works by M. R. Smith, W. S. Creighton, W. M. Wheeler, and others. One searches in vain for a direct credit for these figures, instead finding the following curious statement in the Acknowledgments section: "These drawings follow the modern style of modeling insect drawings as exemplified by the work of the artists Sara H. Deborg [Debord] and A. D. Cushman in some of M. R. Smith's

works; the technique of Shirley Risser in making open-line drawings, as in Dr. William S. Creighton's *Ants of North America,* has been followed in some instances."

This work amounts to an indiscriminate compilation of the literature concerning Californian (and quite a few non-Californian) ants. The locality data are surprisingly scanty in view of the excellent collecting opportunities in California. The correspondence of Cook's records (stated without collector's name in many cases) with old series in the Wheeler Collection at Harvard is remarkably extensive. Many of the records may have been secured during the author's fleeting sojourn at Harvard as a graduate student.

In matters of arrangement, spelling, and captioning, abundant confusion exists in this book. On page 208, for instance, there are given two figures (after Smith) of *"Strumigenys" rostrata* Emery, although, as the previous page testifies, this species does not occur in California and does not belong to the genus *Strumigenys.* On page 330, figures of four species of *Lasius* are given; these are oriented in such a way that in two of them all conventional diagnostic characters are hidden, rendering identification impossible, while in the other two, enough can be seen to disclose that *"Lasius umbratus subumbratus"* (*L. subumbratus, fide* Creighton) is probably *L. umbratus,* and *"L. interjectus californicus"* (*Acanthomyops claviger californicus, fide* Creighton) is probably *L. neoniger.* In general, the figures original to the book show few of the useful key characters, are often grossly out of scale in individual plates, and are certain to be misleading to the novice. A key in the usual sense is lacking.

Cook presents practically nothing of value for the myrmecologist and much that will hopelessly puzzle the layman residing in California who wants to learn about the ants of his State. In handling this outwardly handsome volume, one cannot help but think of the worthwhile and basic manuscripts on ant biology, the publication of which has been delayed or even prevented for lack of funds, artistic assistance, and working time. It is obvious that *The Ants of California* has wasted a great amount of all three. It is the hope of the present reviewers that somewhat less effort will be wasted in trying to use it for the study of California ants. Fortunately, Creighton's above-mentioned book covers the subject with reasonable thoroughness.—W. L. Brown and E. O. Wilson.

List of Titles of Publications Referred to by Numbers in Entomological Literature in Entomological News.

1. Academia Brasileira de Ciencias, Anais. Rio de Janeiro.
2. Académie des Sciences, Comptes Rendus. Paris.
3. Academy of Natural Sciences of Philadelphia. Notulae Naturae.
4. Academy of Natural Sciences of Philadelphia. Proceedings.
5. Acta Biologica Venezuelica. Caracas.
6. Acta Biotheoretica. Leiden, Netherlands.
7. Acta Zoologica (Int. tidskrift för Zoologi). Stockholm.
8. Acta Zoologica Lilloana. Tucuman, Argentina.
9. American Entomological Society, Transactions. Philadelphia.
10. American Journal of Tropical Medicine & Hygiene. Baltimore, Md.
11. American Microscopical Society, Transactions. Menasha, Wisc.
12. American Midland Naturalist. Notre Dame, Ind.
13. American Museum Novitates. New York.
14. American Museum of Natural History, Bulletin. New York.
15. American Naturalist. Lancaster, Pa.
16. Anatomical Record. Philadelphia.
17. Annales de Parasitologie humaine et comparée. Paris.
18. Annales des Sciences Naturelles, Zoologie. Paris.
19. Annals and Magazine of Natural History. London.
20. Annals of Applied Biology. London.
21. Annals of Tropical Medicine and Parasitology. Liverpool.
22. Anti-locust Bulletin. London.
23. Archives de Zoologie Expérimentale et Générale. Paris.
24. Archives de Zoologie Expérimentale et Générale. Notes et Revue.
25. Arkiv för Zoologi. K. Svenska Vetenskapsakademien, Stockholm.
26. Arthropoda. Asoc. Argent. Artropodologia. Buenos Aires.
27. Australian Journal of Scientific Research, Ser. B. Canberra.
28. Beiträge zur Entomologie (Deutsch. Ent. Inst.) Berlin.
29. Beiträge zur Fauna Perus. Jena.
30. Biological Bulletin. Woods Hole, Mass.
31. Biological Society of Washington, Proceedings. Washington, D. C.
32. Boletin de Entomologia Venezolana. Caracas.
33. Bombay Natural History Society, Journal.
34. Bonner Zoologische Beiträge. Bonn, Germany.
35. British Museum (Nat. Hist.), Bulletin. Entomology.
36. Brooklyn Entomological Society, Bulletin.
37. Broteria, Ser. trimestral. Lisbon, Portugal.
38. Buenos Aires. Instituto Nac. Investig. Ciencias Nat. Zoologica.
39. Bulletin Biologique de la France et de la Belgique. Paris.
40. Bulletin of Entomological Research. London.
41. California Insect Survey, Bulletin. Berkeley, Cal.
42. California Univ. Publications in Entomology. Berkeley.
43. Canadian Entomologist. Ottawa, Ont.
44. Canadian Journal of Zoology. Ottawa, Canada.
45. Ceskoslovenska Spolecnost Ent., Casopis. (Acta Soc. Ent.) Prague.
46. Ceylon Journal of Science, Sect. B. Colombo.
47. Coleopterists' Bulletin. Arlington, Va.
48. Dusenia. Curitiba, Parana, Brazil.
49. Ecological Monographs. Durham, N. C.
50. Ecology. Durham, N. C.
51. Entomologica Americana. Brooklyn Ent. Soc.
52. Entomological Society of America, Annals. Columbus, Ohio.

53. Entomological Society of British Columbia, Proceedings. Vernon.
54. Entomological Society of Ontario, Annual Report. Guelph.
55. Entomological Society of Southern Africa, Journal. Pretoria.
56. Entomological Society of Washington, Proceedings. Washington, D. C.
57. Entomologische Berichten. (Ned. Ent. Ver.) Amsterdam.
58. The Entomologist. London.
59. L'Entomologiste. Paris.
60. Entomologist's Monthly Magazine. London.
61. Eos; Revista Española de Entomologia. Madrid.
62. Evolution. New York.
63. Faune de l'Union Française (Formerly Faune de l'Empire Français).
64. Florida Entomologist. Gainesville.
65. Folia Universitaria. Cochabamba, Bolivia.
66. Great Basin Naturalist. Provo, Utah.
67. Harvard Museum of Comparative Zool. Breviora. Cambridge, Mass.
68. Harvard Museum of Comparative Zoology, Bulletin. Cambridge, Mass.
69. Hawaiian Entomological Society, Proceedings. Honolulu.
70. Hilgardia (California Agr. Expt. Sta.). Berkeley.
71. Illinois State Academy of Sciences, Transactions. Springfield.
72. Institut Scientifique de Madagascar, Mémoires, Ser. E. Tananarive.
73. Iowa State College Journal of Science. Ames.
74. Journal of Animal Ecology. London.
75. Journal of Cellular and Comparative Physiology. Philadelphia.
76. Journal of Economic Entomology. Menasha, Wisconsin.
77. Journal of Experimental Biology. London.
78. Journal of Experimental Zoology. Philadelphia.
79. Journal of Morphology. Philadelphia.
80. Journal of Parasitology. Lancaster, Pa.
81. Kansas Academy of Sciences, Transactions. Manhattan.
82. Kansas Entomological Society, Journal. Lawrence.
83. Kansas University. Science Bulletins. Lawrence.
84. Lambillionea (Union Ent. Belge). Brussels.
85. Lepidopterists' News. New Haven, Conn.
86. Louisiana Academy of Sciences, Proceedings. New Orleans.
87. Mexico. Escuela Nacional de Ciencias Biologicas, Anales.
88. Mexico Univ. Instituto de Biologia, Anales. Mexico City.
89. Michigan Univ. Museum of Zoology, Occasional Papers. Ann Arbor.
90. Microentomology. Stanford University, California.
91. Mocambique; Documentario Trimestral. Lourenço Marques.
92. Mosquito News. New Brunswick, N. J.
93. Musei Zoologici Polonici, Annales. Warsaw, Poland.
94. Musei Zoologici Polonici. Fragmenta Faunistica. Warsaw, Poland.
95. Naples Univ. Instituto e Museo Zoologico, Annuario.
96. National Academy of Sciences, Proceedings. Washington, D. C.
97. Natural History Miscellanea (Chicago Academy of Sciences).
98. Nature. London.
99. Naturforschende Gesellschaft Zurich, Vierteljahrsschrift.
100. Die Naturwissenschaften. Berlin.
101. New York Entomological Society, Journal.
102. Norsk Entomologisk Tidsskrift. Oslo.
103. Notulae Entomologicae. Helsingfors, Finland.
104. Oesterreiche Zoologische Zeitschrift. Vienna.
105. Office National Anti-acridien, Bulletin. Paris.
106. Ohio Journal of Science. Columbus.
107. Oikos; Acta Ecologica Scandinavica. Copenhagen, Denmark.

108. Opuscula Entomologica. Lund, Sweden.
109. Oyo-Kontyu (Nippon Society of Applied Entomology). Tokyo.
110. Pacific Science. Honolulu.
111. Pan-Pacific Entomologist. San Francisco, Cal.
112. Parasitology. London.
113. Physiological Zoology. Chicago.
114. Polskie Pismo Entomologiczne. Wroclaw, Poland.
115. Psyche; A Journal of Entomology. Cambridge, Mass.
116. Quarterly Journal of Microscopical Science. London.
117. Revista Brasileira de Biologia. Rio de Janeiro.
118. Revista de Investigaciones Agricultura. (Argent. Min. Agr.) B. A.
119. Revue Française de Lepidopterologie. Douelle, France.
120. Revue Suisse de Zoologie. Geneva, Switzerland.
121. Rio de Janeiro. Instituto Oswaldo Cruz, Memorias.
122. Rio de Janeiro. Museu Nacional do Brasil, Boletim, Zool.
123. Rivista di Parassitologia. Rome, Italy.
124. Royal Entomological Society of London, Proceedings, Ser. A.
125. Royal Entomological Society of London, Proceedings, Ser. B.
126. Royal Entomological Society of London, Transactions.
127. Royal Society of London, Proceedings, Ser. B.
128. São Paulo, Brazil. Depart. Zool., Secr. Agr., Papéis Avulsos.
129. São Paulo, Brazil. Instituto Biologico, Arquivos.
130. Schweizerische Entomologische Gesellschaft, Mitteilungen. Bern.
131. Smithsonian Miscellaneous Collections. Washington, D. C.
132. Sociedad Cientifica Argentina, Anales. Buenos Aires.
133. Sociedad Entomológica Argentina, Revista. Buenos Aires.
134. Sociedad Mexicana de Historia Natural, Revista. Mexico City.
135. Société d'Histoire Naturelle de Toulouse, Bulletin.
136. Société Entomologique de Belgique, Bulletin et Annales. Brussels.
137. Société Entomologique de France, Annales. Paris.
138. Société Entomologique de France, Bulletin. Paris.
139. Société Fouad I d'Entomologie, Bulletin. Cairo, Egypt.
140. Société Linneenne Lyon, Bulletin Mensuel.
141. Société Zoologique de France, Bulletin. Paris.
142. Society for British Entomology, Journal. Bournemouth, England.
143. Society for British Entomology, Transactions. Bournemouth, Eng.
144. South London Entomological & Nat. Hist. Society, Proc. & Trans.
145. Southern California Academy of Sciences, Bulletin. Los Angeles.
146. Systematic Zoology. Washington, D. C.
147. Tennessee Academy of Sciences, Journal. Nashville.
148. Texas Journal of Science. College Station, Texas.
149. Tijdschrift voor Entomologie. Amsterdam.
150. Tohoku University. Science Reports, Ser. 4. Tohoku, Japan.
151. U. S. National Museum, Proceedings. Washington, D. C.
152. Washington Academy of Sciences, Journal. Washington, D. C.
153. Wasmann Journal of Biology. San Francisco, Cal.
154. Zoologica. New York.
155. Zoological Society of Bengal, Proceedings. Calcutta, India.
156. Zoological Society of London, Proceedings.
157. Zoologische Jahrbücher. Abt. Anatomie u. Ontogenie. Jena.
158. Zoologische Jahrbücher. Abt. Systematik, Ökologie u. Geogr. Jena.
159. Zoologische Jahrbücher. Abt. allg. Zoologie u. Physiologie. Jena.
160. Zoologischer Anzeiger. Leipzig.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

American Sarcophagidae—wanted for identification. H. R. Dodge, P.O. Box 185, Chamblee, Georgia.

German lepidopterist wishes to correspond and receive live material (eggs and pupae) in exchange for dried imagoes. Johannes Reichel, Koenigsberg, Krs. Wetzlar 16, Germany.

For exchange—The periodic Cicada, T. septendecim. Desire Lepid., espec. Papil., Sphing. & Speyeria. Also Col., espec. Ceramb. & Lucan. John W. Morris, 2704 Genesee St., Syracuse 9, N. Y.

Cynipid and Itonidid galls—American species wanted; purchase or exchange for British species. Fresh or dried. D. Leatherdale, F.R.E.S., Old Woodstock, Oxford, England.

Wanted—Reprints or papers concerning insects taken in Alaska for inclusion in list of Alaskan insects. R. H. Washburn, Alaska Experiment Station, Palmer, Alaska.

Conopidae of the World wanted. Will pay 10¢ to $1.00 for pinned and labelled specimens. S. Camras, 4407 N. Milwaukee Ave., Chicago 30, Illinois.

Anisoptera—Nearctic sp. wanted for exchange, espec. Ophiog., Arigom., Aeschna, Neurocor., Somatoc., Cordulia, Dorocor., Leucor. R. D. Cuyler, N. C. State College, Raleigh, N. C.

Bembicini and Stizini (Hym., Sphec.) of New World wanted for revis. study. Will return upon request or at end of project. James E. Gillaspy, Dept. of Zoology, Univ. Texas, Austin 12, Texas.

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